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FOREST INSECT CONDITIONS

in the Intermountain States during 1965

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DIVISION OF TIMBER MANAGEMENT
REGION FOUR
FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE
OGDEN, UTAH

This is an accounting of the important forest insect problems occurring in the Intermountain States during 1965. Information in this report was compiled from aerial surveys, from ground examinations to supplement aerial findings, and from special biological evaluation surveys to determine population status and trends.

More than 400 hours of flying by trained observers was required to map the infestations on 18 National Forests, 3 National Parks, 4 National Monuments and portions of other federally owned and state and private forest lands throughout the Intermountain States. On-the-ground examinations and biological evaluations were intensive in some areas but limited in others. Because of the high priorities and a shortage of manpower, evaluation efforts were concentrated on the massive mountain pine beetle outbreaks in western Wyoming and eastern Idaho and the extensive spruce budworm infestation in central Idaho. As a result many problem areas of lesser consequence received only limited attention or were not examined.

For convenience of discussion and not necessarily in order of importance, the various insect problems are consolidated and arranged into three broad categories: bark beetles, defoliators, and other insects. The latter group consists of twig and bud moths, insects injurious to cones and seed, and sucking insects. A map showing the Region-wide distribution of some of the most important forest insects during 1965 is appended.

COVER: Mountain pine beetle control is a year-round effort. Drawing is of snow vehicle used to transport forest crews into control areas when snow cover prevents access by other means.

FOREST INSECT CONDITIONS IN THE INTERMOUNTAIN STATES DURING 1965

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And

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Division of Timber Management

Region Four Forest Service

U.S. Department of Agriculture

Ogden, Utah

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RESUMÉ OF CONDITIONS

The mountain pine beetle continues its destructive march through the lodgepole pine forests of the Region. Over 2½ million trees are infested in severe outbreaks in the Grand Teton National Park and in the Teton and Targhee National Forests. Control by logging and other means has been undertaken to reduce the impact of the huge infestation in the Teton area on timber, recreational and scenic values. Biological control measures have had little impact on the population and cannot be expected to exert an immediate controlling influence; consequently, even greater beetle activity is forecast for most of the noncontrol areas in 1966. Increased Douglas-fir beetle activity occurred in one area in southern Idaho, but elsewhere throughout the Region populations have remained static. Killing of ponderosa pine by the western pine beetle has reached a low level and should retain that status through 1966. Engelmann spruce beetle attacks increased in a logging area in southern Utah, but prompt removal or treatment of infested debris will minimize the threat of a future buildup.

Spruce budworm damage continued at high levels in central Idaho, although noticeable defoliation decreased considerably over that detected last year. Biological data indicates increased damage in portions of the Salmon National Forest where control is proposed. Elsewhere the budworm is expected to maintain its current status through 1966. The sugar pine tortrix in association with other lepidopterous insects caused extensive defoliation of lodgepole pine throughout the northern portion of the Region. Trees undergoing successive years of defoliation, though permanently stunted and deformed, are seldom killed. Little change in the course of the infestation is expected next year and no control is planned. Defoliation of pinyon pine by a sawfly was widespread through portions of southwest Nevada. Douglas-fir tussock moth populations in southwestern Idaho were reduced by a native polyhedrosis virus which is expected to result in reduced activity next year. A severe tent caterpillar infestation of Fremont poplar in Zion National Park was successfully controlled by mistblower application of Bacillus thuringiensis. Less serious infestations of other defoliators, sucking insects and tip and shoot moths continued attacks on conifers, hardwoods and a variety of range plants in all Intermountain States this year.

BARK BEETLES

Mountain pine beetle, Dendroctonus ponderosae Hopk. (=monticolae)

Lodgepole pine

The mountain pine beetle continues to be the single most important forest insect problem in the Intermountain States this year. Infestations of epidemic proportions persist on the Teton National Forest and in Grand Teton National Park in western Wyoming and on adjoining Targhee National Forest in eastern Idaho. Less serious but, nevertheless, potential infestations continue to deplete lodgepole pine stands on Bureau of Land Management land in Idaho and Wyoming; on the Caribou, Boise and Sawtooth National Forests in southern Idaho; the Cache National Forest in southern Idaho and northern Utah; and on the Bridger National Forest in western Wyoming. Past control efforts on the Ashley and Wasatch National Forests in northeastern Utah have reduced the beetle problem there to a tolerable level.

Control by logging has been undertaken wherever possible but due to the tremendous size of the infestations, additional treatment was necessary. In Grand Teton National Park infested trees were sprayed standing. In the Teton and Targhee National Forests and elsewhere in the Region, control was by spraying, felling and burning, and by logging. Some 25,000 trees were treated or logged on the Targhee National Forest. More than 312,000 trees were treated or logged on the Teton Forest and 126,000 were treated in Grand Teton National Park in a concerted effort with the National Park Service to suppress the extensive infestation in the Jackson Hole area.

In the Teton area, the most serious infestations exist in the northern portions of the Forest and Park. In one control area, south of the Buffalo River, the number of infested trees has been reduced from 181,000 in 1964 to 110,000 in 1965. North of the Buffalo River, the infestation stretches into the Teton Wilderness Area with over one million trees attacked this year. Small infestation centers exist along the Yellowstone National Park border. No control is planned within the Wilderness Area, but treatment will be undertaken along the western edge of the boundary and in Grand Teton National Park in an attempt to shunt the infestation away from the critical recreation areas bordering Jackson Hole and the Snake River.

The huge infestation on the Targhee National Forest, southeast of Rexburg, Idaho, continues unabated. This outbreak has been

on the increase since 1959, and in some areas upwards of 95 percent of the merchantable trees have been killed. Logging to minimize tree loss and reduce beetle populations will continue as before but no chemical treatment is planned.

Elsewhere on the Targhee National Forest and adjacent state and private lands, serious infestations extend from Teton Creek in the south, along the west bench of the Grand Teton Range, north to Sheridan Reservoir. Surveys show over 190,000 infested trees on the Forest and 58,000 on adjacent state and private holdings. Suppressive action has been started and this work will be carried through 1966.

A system for predicting the course of mountain pine beetle outbreaks in the Intermountain Region was developed by research personnel and extensively applied by evaluation crews. This method entails sampling various development stages from fixed size bark samples, accumulating brood counts sequentially, and comparing the counts to a prediction table. In this Region, the arbitrary breaking point between endemic and epidemic conditions during fall sampling appears to be a brood count of 180 per square foot of bark surface. Practically all of the counts taken from infested lodgepole this fall exceeded this criterion. Brood counts of 300 or more were common. Samples taken from Thurburn Ridge on the Targhee National Forest and Ditch Creek on the Teton National Forest had brood counts of 465 and 450 per square foot of bark surface, respectively. Moreover, many counts were conservative as the samples were taken before egg deposition was completed.

Variable brood conditions were found in several of the infested areas during 1965. In some instances, egg laying ceased in the fall and may be continued next spring. Progeny from last year's fall brood emerged normally but some of the spring brood either emerged late in the fall or remained in the dead trees as mature larvae, pupae or tenerals, some of which may emerge early in 1966. This phenomena may result in three flight periods, the first being in the spring from mature broods overwintering in dead trees; the second being late fall flights and subsequent new attacks resulting from spring egg deposition; and finally, normal summer flights. The first two phenomena have yet to be observed in the Region, and it is likely that should they occur, they would be negligible compared to the main flight period. Observations on premature emergence will be made from caged trees during early spring, 1966.

The end of this widespread tree killing in the Intermountain Area is not yet in sight. Adverse biological factors have had little, if any, influence in controlling this tremendous population impetus. And there is no indication that these factors will play a significant role in preventing subsequent mass tree killing in the near future.

The effects of artifical control measures are relatively short lived. Land managers have inherited large areas of almost continuous lodgepole stands that are overstocked, overmature, stagnated and inaccessible. Although specific control programs may reduce tree killing in some areas and restrain incipient outbreaks in others, they do not offer a long term solution. Only through sound forest management practices geared to creating and maintaining conditions unsuitable for beetle buildups and survival, will this problem be solved.

Ponderosa pine

A persistent infestation of the mountain pine beetle in second growth ponderosa pine has killed over 2,000 trees on private land near Warner's Pond, southeast of Cascade, Idaho. Limited group killing occurred on the Ashley National Forest near Flaming Gorge. With the exception of the Idaho infestation which is expected to increase in 1966, all other attacks by this beetle in ponderosa pine have declined.

Douglas-fir beetle, Dendroctonus pseudotsugae Hopk.

For almost a decade preceding 1962, massive attacks by the Douglas-fir beetle killed millions of board feet of Douglas-fir timber annually in Region-wide outbreaks. In 1962 and the spring of 1963 most of these large infestations subsided and although serious losses are continuing in some areas, overall losses are far below those experienced during the outbreak years.

One infestation that failed to subside, however, continues to kill Douglas-fir on the Sawtooth National Forest in southern Idaho. From 1961 through 1964, over 9 MM board feet of infested and green timber was logged from this area to salvage losses and lessen the risk to the remaining stands by removing mature and overmature trees. An additional 4.4 MM of infested and green timber was removed in 1965. In spite of these continuing efforts, more than 2,500 trees were infested and high brood counts indicate that epidemic conditions will continue for at least another year. Logging will be continued until the infestation subsides.

On the Dixie and Fishlake National Forests in southern Utah, tree killing continues but considerably less than a few years ago. Some large group infestations continue to exist, but most losses occur as single attacks or small groups of 2-5 trees in or nearby areas of old beetle activity.

Individual outbreaks scattered over relatively wide areas are slowly but steadily depleting Douglas-fir stands in portions of the Cache and Caribou National Forests in southeastern Idaho. Unless

natural measures take effect, beetle populations and tree killing are expected to remain at the same level through 1966.

A potential hazard for Douglas-fir beetle buildup exists on portions of the Payette, Boise, Challis and Sawtooth National Forests in Idaho. In late 1964, heavy rains and strong winds in the aftermath of an unseasonable thaw, felled thousands of trees over relatively large areas. Intensity of damage ranged from one to one hundred fifty trees per acre. Tree size ranged from 6 to 12 inches in diameter. Damage varied from top breaks and stems snapped off at ground level to whole trees completely uprooted. Wherever Douglas-fir material was found, broods were consistently found in the lower half of the boles. Uprooted trees and others presenting moist conditions, contained broods throughout their entire circumference. Most of these broods can be expected to emerge in the spring of 1966 and attack fresh downed material or standing trees. However, the effects of host desiccation, predators, parasites and other factors affecting brood survival will not be known until spring of 1966.

Western pine beetle, Dendroctonus brevicomis Lec.

A characteristic buildup pattern of western pine beetle is showing up in mature and overmature ponderosa pine stands near Smiths Ferry, Idaho, on the Boise National Forest. In the past, infestations have built up in three to five years, then quickly subsided from natural causes. Infestations are characterized by group attacks, usually 2 to 5 trees in a group, with new groups appearing each year until an epidemic condition is reached. This is the third year of the present infestation. Although bark samples showed relatively heavy populations of parasites and predators, they were not sufficient to offset the exceptionally heavy western pine beetle broods. Consequently, a slight increase in tree killing is expected in 1966.

A small but potential infestation was brought under control by chemical treatment in Pine Valley on the Dixie National Forest in southern Utah.

Engelmann spruce beetle, Dendroctonus obesus Mann.

Natural enemies and timely and persistent control programs have reduced this beetle to a low level in Engelmann spruce stands throughout the Intermountain States. One small but potentially troublesome infestation is active in a logging sale area on the Dixie National Forest. Heavy broods and some hibernating adult beetles were found in slash and stumps. The broods consisted of eggs, larvae and pupae which will mature next year, overwinter as hibernating adults, emerge in 1967 and enter fresh slash or attack standing green timber. The current hibernators will enter slash next spring or possibly attack standing trees. In any event, timely treatment of infested material will remove the threat of a possible outbreak.

Fir engraver beetles, Scolytus ventralis Lec. and Dryocoetes confusus Sw.

Aerial surveys revealed increased mortality of true firs throughout most of the southern portions of the Region. The primary causal agent was first thought to be one or both of the above engraver beetles, but subsequent ground examinations disproved this, nor were any pathogens identified with the mortality. We suspect the problem to be physiological in nature, with a contributing factor being excessive moisture, a condition that has prevailed in many parts of the Region the last two years.

Although true firs are being affected throughout their range, areas of greatest concentrated damage occur in localized areas on the Bridger National Forest in western Wyoming and the Uinta and Wasatch National Forests in Utah. Intensity of damage varies from scattered groups of 5-10 trees to concentrations of several hundred trees. Heaviest losses are to subalpine fir, a high elevation species valuable primarily for watershed protection but also the principal forest cover on many of the Region's all-season recreational areas. Considerable mortality of subalpine fir has become increasingly evident during recent years in the Alta, Brighton, Solitude and Park City, Utah, ski area complex, a potential site for the 1972 winter olympics.

Red turpentine beetle, Dendroctonus valens Lec.

Approximately 100-125 ponderosa pines were heavily infested with D. valens along the North Fork highway, south of Gibbonsville, Idaho. This outbreak is now in its second year. The infestation is on private land within the Salmon National Forest. Although highly unusual, some trees were attacked as high as 15 feet. Ips sp. filled in those portions of the trees not attacked by the turpentine beetle.

Unless control measures are taken, the infestation is expected to continue at the present level through next year.

DEFOLIATORS

Spruce budworm, Choristoneura fumiferana (Clem.)

The spruce budworm continues to be a major threat to Douglas-fir, Engelmann spruce, and true firs in the Intermountain Region. The largest and most damaging infestations occur in central and southern Idaho on four National Forests. Smaller and less serious outbreaks exist in western Wyoming and southern Utah.

The outbreak in Idaho started in 1951 and continued to increase in size and destructiveness until 1954, the year of the first

large scale aerial spray project in this Region. This spray program continued for four consecutive years until more than two million acres of valuable forest land were treated. Budworm populations began to build back rapidly in some areas and extend into others, requiring an additional 750,000 acres of treatment in 1963-64. At this time, the extent of budworm coverage approximates that of the 1961-63 buildup years. The 1964 control effort was the principal factor in the decrease in infested area. A breakdown of spruce budworm infested acreage by damage categories since 1960 in the Intermountain Region follows:

INFESTATION INTENSITY

YEAR	LIGHT	MODERATE	HEAVY	TOTAL
1960	297,000	80,000	19,000	396,000
1961	643,000	229,000	553,000	1,425,000
1962	480,000	373,000	788,000	1,641,000
1963	357,800	276,600	988,800	1,623,200
1964	266,000	658,000	1,352,000	2,276,000
1965	465,600	254,500	795,200	1,515,300

Although the table shows a reduction of some 760,000 acres over that infested in 1964, the actual difference may be considerably less. Budworm development was retarded and light feeding damage in some areas may have gone unnoticed during early detection flights. Also much of the area within the boundaries of the 1964 control project on the Salmon National Forest was flown too late for optimum damage signs. Early storms removed many of the damaged needles and subsequent unfavorable flying weather caused early termination of the survey; consequently, it was impossible to cover all of the control area. Ground examination, however, coupled with egg mass samples, revealed increased budworm activity in some locations within the control area boundaries. This rapid buildup in the control area likely resulted from one, or a combination of the following courses: (1) residual budworm not killed by the spray, (2) relatively heavy residual populations left in the protective strips along streams and in other critical areas not sprayed, and (3) invasion by moth flights from contiguous, unsprayed areas.

Reductions in a few areas resulted from increased parasite and predator activity. Heavy rain and hail storms during moth flight in 1964 caused a sizeable decrease in the extent of infested acreage on the Sawtooth National Forest.

Only a few new localized infestation centers were reported this year. The most significant new find was approximately 10,000 acres of lightly

defoliated Douglas-fir and subalpine fir in the Greys River drainage on the Bridger National Forest in western Wyoming. The infestation on the Fishlake National Forest in southern Utah, discovered in 1964, decreased in area but feeding activity remained about the same. The full extent of budworm activity in the Intermountain Area during 1965 is as follows:

	INFESTATION INTENSITY			
FOREST	LIGHT	MODERATE	HEAVY	TOTAL
Bridger	10,000	-	-	10,000
Boise	-	-	60,200	60,200
Challis	83,200	20,500	297,600	401,300
Fishlake	10,000	-	-	10,000
Payette	19,800	105,000	92,000	217,000
Salmon	296,500	77,400	336,000	709,000
Sawtooth	-	9,000	-	9,000
Targhee	46,100	42,600	9,200	97,900
TOTAL	465,600	254,500	795,200	1,515,300

Predictions of population levels and damage in 1966 are based on the number of last year's egg masses coupled with pupal density counts. From these data a general increase in budworm activity throughout most of central and southern Idaho is predicted. Heavy damage is expected on the Salmon National Forest, particularly in those areas with heavy budworm populations and a history of repeated defoliation. If control is not undertaken, top kill of the overstory, top kill and limited mortality of the intermediate crown classes, and extensive kill of the understory can be expected. Similar damage can be expected in portions of the Challis, Sawtooth and Payette National Forests, but not of sufficient intensity to warrant control, at least in 1966. The isolated infestations on the Bridger and Fishlake Forests may increase in size but defoliation will range from negligible to light.

The relatively heavy spider mite populations following the 1963 DDT control project on the Targhee National Forest in southeast Idaho decreased appreciably this year over 1964. A significant buildup of spider mite activity in Douglas-fir in certain areas within the 1964 spray boundaries on the Salmon Forest was noted this year. Particularly heavy populations were found in Porphyry Creek; lighter but noticeable damage occurred in many side drainages north of the Salmon River. An increase in spider mite activity can be expected throughout most of the 1964 Salmon spray area in 1966.

Tussock moths, Hemerocampa spp. and Halisidota spp.

Two separate infestations of the Douglas-fir tussock moth, Hemerocampa pseudotsugata McD., are active on Douglas-fir in Owyhee County in southwest Idaho. The first one, near South Mountain and covering more than 1,500 acres, has been in progress since 1958. Since then the frequent occurrence of a native polyhedrosis virus has resulted in year to year population fluctuations. This year a decline is in evidence again.

A second infestation, covering about 2,000 acres in the North Fork of Boulder Creek southeast of Silver City was found this year. Although defoliation was relatively heavy, very few new egg masses could be found. There is little doubt that the larvae population was substantially reduced by the native virus. Both of these infestations are expected to be at a low level next year.

Another tussock moth, Hemerocampa sp. continued to defoliate ponderosa pine saplings, bitterbrush, ceanothus and other range plants on the Boise Basin Experimental Forest and Town Creek plantation on the Boise National Forest. This infestation, first noticed in 1959, was controlled in 1962 to protect the ponderosa pine reproduction. Since 1962 insect numbers and subsequent feeding activity have increased. Ceanothus and other range plants were moderately to heavily defoliated last year. Light but increasing damage occurred in some of the ponderosa pine plantings. Egg mass surveys this year forecast increased defoliation for 1966.

A late hatch of a tussock moth, Hemerocampa vetusta (Bdv.) continued to cause moderate to severe defoliation over extensive bitterbrush range between Reno and Carson City, Nevada. No change in the status of this insect is anticipated in 1966. Serious past infestations of other tussock moths, Halisidota ingens Edws., occurring on pinyon pine and H. argentata subalpina French, on juniper in the Uintah and Ouray Indian Reservation, Utah, have been reduced to a low level by a combination of natural factors. No signs of defoliation were noted this year.

A tent caterpillar, Malacosoma sp.

Aggressive populations of a tent caterpillar, Malacosoma sp., caused widespread defoliation, branch killing, and some mortality of Fremont poplar, in southern Utah. The infestation extends from St. George, east along the Virgin River into Zion National Park. A particularly severe infestation persisted in the Park, threatening complete defoliation of more than 1,000 acres of Fremont poplar, the principal shade tree. Control was undertaken by mistblower application of Bacillus thuringiensis, mixed

in the proportion of 2 quarts Bt in 9½ gallons of water and sprayed at a rate of 10 gallons per acre. Overall effectiveness was good.

To date, natural factors have had little effect in reducing tent caterpillar populations. Overwintering egg populations have not been evaluated, consequently damage predictions for 1966 cannot be made at this time.

Malacosoma sp., a defoliator of bitterbrush, Purshia tridentata, was active in several areas of southern Utah. Control by Bacillus thuringiensis was undertaken against a moderate infestation in Bryce Canyon National Park, but the overall effectiveness of the microbial insecticide was masked by the sudden occurrence of a lethal cytoplasmic polyhedrosis virus. Heavy larval mortality was followed by a sudden drop in egg mass counts, indicating that negligible defoliation of bitterbrush in Bryce Canyon National Park can be expected in 1966. Status and trend of this tent caterpillar elsewhere in southern Utah are unknown.

Sugar pine tortrix, Choristoneura lambertiana (Busck)

A complex of lodgepole pine terminal feeders caused moderate to severe defoliation in practically all of the lodgepole pine stands in the northern half of the Region. Most of the damage was caused by the sugar pine tortrix, Choristoneura lambertiana (Busck). Associated with this defoliator but playing a subordinate role were the jack pine budworm, Choristoneura pinus Freeman; the pine needle sheath miner, Zelleria haimbachi Busck; and Argyrotaenia spp.

The heaviest defoliation occurred on 9,000 acres, northwest of Bishop Mountain on the Targhee National Forest. Three consecutive years of feeding by these insects have caused many trees to become permanently stunted and deformed. All trees in this area underwent complete defoliation of the current years growth. Elsewhere, moderate to heavy defoliation occurred in other areas of the Targhee National Forest and in Coburn and Game Creeks on the Teton National Forest and along the west bench of Palisades Reservoir on the Caribou National Forest. Other areas throughout the northern half of the Region are likely to have light but damaging populations of this complex, but they remained undetected as light feeding activity is difficult to see from the air. Most of the lightly defoliated areas that were detected were found accidentally by ground crews performing mountain pine beetle evaluations.

Parasites, predators, and other natural factors may reduce the population next year but the possible extent of action of these control agents is unpredictable. Historically, these outbreaks subside or move into new areas the year after serious defoliation.

Lacking information to the contrary, we expect that the population will maintain its current status, and possibly spread into new areas. No control is planned.

Anacamptodes clivinaria (Guenée)

This is the fourth consecutive year of defoliation of mountain mahogany by this geometrid in the Juniper Mountains, Owyhee County, Idaho. The infestation, discovered in 1962, increased during 1963, but took a downward trend in 1964-65. This trend was reflected by the gradual reduction in numbers of overwintering pupae from 1962 to the present. From a high in 1962 of 30 pupae per square foot of soil surface, counts decreased to 13 in 1963, 6 in 1964 to less than 2 in 1965. If these counts prove to be a reliable index of the trend as they have in the past, very little, if any, defoliation of mountain mahogany is to be expected in 1966.

White fir needle miner, Epinotia meritana Hein.

Predicted increases in damage to white fir in portions of southern Utah by the needle miner did not materialize. The occurrence of early storms during this year's moth flight is thought to be the primary factor contributing to the unexpected decline. Only negligible defoliation occurred in Bryce Canyon National Park and Dixie National Forest. The forecast for 1966 is for damage to be about the same or decrease slightly.

Aspen leaf tier, Sciaphila duplex (Wlsh.)

Populations of aspen leaf tier have been epidemic in aspen stands of Utah since 1961. Infestations in southern Idaho and western Wyoming decreased in 1962-63. Number of acres infested in Utah decreased by more than half in 1964. In 1965 about 50,000 acres were heavily defoliated on the Fishlake and Dixie National Forests, Utah. Intensity of damage increased in the Sheep Valley and the UM Pass areas on the Fishlake National Forest where leaf tier infestations were first detected. The large aspen tortrix, Choristoneura conflictana (Wlk.) was prominently associated with all aspen leaf tier infestations. Three thousand acres were moderately defoliated by the large aspen tortrix on the Aquarius Plateau, Dixie National Forest. Number of acres infested is expected to decrease in 1966 but damage in the Sheep Valley and UM Pass areas is expected to be heavy.

A Sawfly, Neodiprion edulicolus Ross.

A sudden buildup of this sawfly caused serious defoliation, branch killing, and some mortality of singleleaf pinyon pine near Caliente in southeastern Nevada. This infestation was discovered in 1958 and collapsed in 1961 due to a late freeze, but it recurred again this

year on more than a quarter million acres. Land managers are concerned because pinyon pine, long regarded as noncommercial except for fuel and its edible seed, is now a highly sought after and commercially valuable Christmas tree. Defoliation by this sawfly has rendered many trees unfit for sale.

Pupal mortality was exceptionally heavy in some areas but absent in others. Parasitism by a chalcid, Dibrachys sp., ranged from none to 90 percent and averaged 48 percent. It was not uncommon to rear as many as 30 chalcid adults from a single sawfly pupa. In spite of this heavy parasitism, sawfly emergence and subsequent oviposition was relatively high. The status of the infestation will not be determined until spring at which time overwintering survival of the eggs and young larvae establishment will be more fully evaluated.

A Looper, Nepytia freemani Monroe

White fir, Abies concolor, has undergone light to moderate defoliation by this geometrid in Timpanogos Cave National Monument in northern Utah. Larvae were heavily parasitized but moth flight and subsequent egg deposition also appeared heavy. At this time the status of this defoliator is unknown.

Fall webworm, Hyphantria cunea (Drury)

Control was undertaken against moderate populations of this colony insect in Capitol Reef National Monument in southern Utah. Park Service personnel, anticipating a serious buildup on Fremont poplar, the principal shade tree, removed and burned more than 1,600 individual colonies. Because of these intense efforts, there is little chance that the webworm will reach a destructive level in 1966.

OTHER INSECTS

A cone worm, Dioryctria sp.

This insect caused damage to pinyon pine cones in localized areas throughout Nevada and Utah. A relatively heavy infestation destroyed one-third to one-half the cone crop in Sawmill Canyon, south of Ely, Nevada.

Pitch nodule moth, Petrova albicapitana var. arizonensis (Hein.)

Pitch nodule moth populations were epidemic on several thousand acres of pinyon pine in the Region. Tip killing was serious on Bureau of Land Management land and on the Dixie National Forest

in southern Utah. Damage was considerably heavier this year making many trees unfit for Christmas trees. Evaluations this fall showed populations were significantly reduced by natural factors. Although the area of infestation will likely remain unchanged, tip killing is expected to be light in 1966.

An Aphid, Cinara sp., and the pine needle scale, Phenacaspis pinifoliae (Fitch)

Heavy aphid activity was observed this spring on Jeffrey pine in Robinson Creek on the Toiyabe National Forest in eastern California. Associated with the aphid but of little apparent consequence was the pine needle scale, Phenacaspis pinifoliae (Fitch). Feeding damage as evidenced by foliage discoloration was particularly heavy in some areas. The situation improved rapidly during the summer, however. Fall examinations showed that most of the affected trees regained their color and little evidence of aphid activity could be found. Unusually moist conditions as a result of above normal rainfall during the summer months is one factor thought to be responsible for the sudden decline.

Spittlebug, Clastoptera sp.

Spittlebugs increased on juniper stands in southwestern Utah and eastern Nevada. Heaviest damage was observed near Iron Mine Mountain and Penac Summit west of Cedar City, Utah, and in the Dolly Varden Mountains north of Ely, Nevada. Excessive feeding causes branch tips to yellow, then dry up, and eventually die. Many of the weakened and dead tips are broken off by winds.

Very little is known about this insect, but from observations of past trends, we believe the size of area infested and intensity of damage will increase next year.

Grass plant bug, Labops hesperius Uhler

This insect has caused heavy damage to crested wheat grass on rangeland in portions of the Dixie National Forest in southern Utah. Because of excessive top kill in the Asay Bench seeding area in 1964, grazing was stopped and emergency control measures were taken in 1965. More than 400 acres were sprayed by truck mounted mistblower with malathion at a rate of one-half pound per acre. Control was successful with minimal injury to the forage. This infestation is expected to remain at a low level through 1966.

A steady buildup of this pest has been observed in the Pine Valley seeding area, also on the Dixie National Forest. Unless natural measures reduce the population, control may be necessary in 1966.

Sheep day moth, Pseudohazis sp.

The sheep day moth has caused defoliation of snowberry on some forests in this Region the past few years. Heavy populations have completely defoliated snowberry in localized areas on the Manti-LaSal and Caribou National Forests. Although total defoliation has occurred, the plants usually recover with little or no noticeable permanent damage.

DISTRIBUTION OF MAJOR FOREST INSECT INFESTATIONS IN REGION 4

1965

LEGEND

- Black Hills Beetle
- Douglas-fir Beetle
- Douglas-fir Tussock Moth
- Spruce Budworm
- Pinyon Pine Sawfly

Based on aerial and ground surveys.

DIVISION OF TIMBER MANAGEMENT
FOREST SERVICE — REGION FOUR
U S DEPARTMENT OF AGRICULTURE

SCALE miles 0 50

LEGEND

- NATIONAL FOREST AREAS
- PRIMITIVE, WILDERNESS, WILD AND SCENIC AREAS
- NATIONAL PARK OR NATIONAL MONUMENT
- STATE LINE
- COUNTY LINE
- MAIN MOTOR HIGHWAY
- GOOD MOTOR ROAD
- RAILROADS
- SUPERVISORS HEADQUARTERS
- DISTRICT RANGER HEADQUARTERS
- I. F. & R. E. S. CENTERS
- STATE CAPITOL
- COUNTY SEAT
- CITY OR TOWN
- MUNICIPAL AIRPORTS